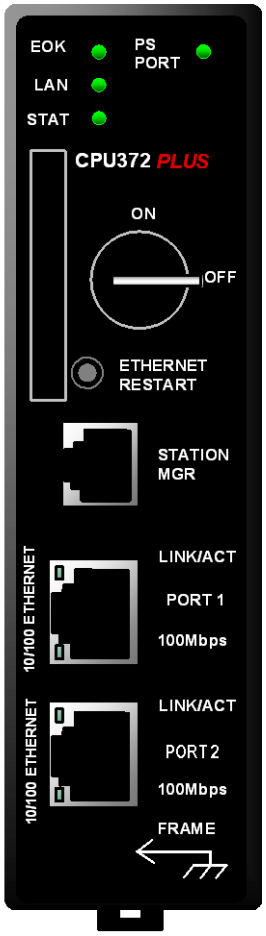
Series 90*-30 PLC

IC693CPU372-BG

CPU372 PLUS

GFK-2491F
February 2012



The CPU372 *PLUS* is ideal for high speed processing that requires Ethernet connectivity. The Series 90*-30 CPU372 *PLUS* provides a built-in enhanced Ethernet interface that provides TCP/IP communications with:

- Series 90, PACSystems, and VersaMax PLCs
- Host computers running the Host Communications Toolkit or CIMPLICITY software
- Computers running the TCP/IP version of the programming software

CPU Features

- High speed Boolean and non-Boolean processing provided by a 586-class 133MHz processor
- Two Ethernet ports: 10/100 Mbytes (one IP address) with a built-in, auto-sensing Ethernet switch
- Support for EZ Store Device allows you to download a program without a PC
- 120KB of user memory

Key Ethernet Features

- Full PLC programming and configuration services
- Periodic data exchange using Ethernet Global Data (EGD) and EGD commands to read and write PLC and EGD exchange memory over the network
- TCP/IP communication services using SRTP
- Support for SRTP Client (Channels)
- Modbus/TCP Server, supporting Modbus Conformance classes 0, 1, and 2.
- Modbus/TCP Client, supporting Modbus Conformance classes 0, 1, and Function Codes 15, 22, 23, and 24 for Conformance class 2.
- Remote PLC monitoring from a web browser
- Comprehensive station management and diagnostic tools
- Support for Classless IP Addressing

Ordering information

Description	Catalog Number
Series 90-30 CPU372 PLUS	IC693CPU372
Auxiliary Battery Module	IC693ACC302
High Capacity Power Supplies	
120/240 VAC/125 VDC, 30W	IC693PWR330
24 VDC, 30W	IC693PWR331
12 VDC, 30W	IC693PWR332
E-Z Program Store Device	IC200ACC003

The CPU374 *PLUS* requires a high capacity power supply.

Because the built-in battery is limited to 1.2 months of continuous power outage, an IC693ACC302 external battery is recommended.

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IC693CPU372 PLUS Specifications

Controller Type	Single slot CPU module with embedded Ethernet Interface
Processor	
Processor Speed	133 MHz
Processor Type	AMD SC520
Execution Time (Boolean Operation)	0.15 μsec per Boolean instruction
Type of Memory Storage	RAM and Flash
Memory	
User Memory (total)	120KB **Note:** Actual size of available user program memory depends on the amounts configured for %R, %AI, and %AQ word memory types.
Discrete Input Points - %I	2,048 (fixed)
Discrete Output Points - %Q	2,048 (fixed)
Discrete Global Memory - %G	1,280 bits (fixed)
Internal Coils - %M	4,096 bits (fixed)
Output (Temporary) Coils - %T	256 bits (fixed)
System Status References - %S	128 bits (%S, %SA, %SB, %SC - 32 bits each) (fixed)
Register Memory - %R	Configurable 128 to 32,640 words
Analog Inputs - %AI	Configurable 128 to 32,640 words
Analog Outputs - %AQ	Configurable 128 to 32,640 words
System Registers - %SR	28 words (fixed)
Timers/Counters	>2,000 (depends on available user memory)
Hardware Support	
Battery Backed Clock	Yes
Battery Back Up (Number of months with no power)	1.2 months for internal battery (installed in the power supply) 15 months with external battery (IC693ACC302)
Load Required from Power Supply	7.4 watts of 5VDC. High Capacity power supply required.
Hand Held Programmer	CPU372 does not support Hand Held Programmer
Program Store Devices supported	PLC Program Download Device (PPDD) and EZ Program Store Device
Total Baseplates per System	8 (CPU baseplate + 7 expansion and/or remote)
Software Support	
Interrupt Support	Supports the periodic subroutine feature.
Communications and Programmable Coprocessor Compatibility	Yes
Override	Yes
Floating Point Math	Yes, hardware floating point math
Communications Support	
Built-in Serial Ports	No serial ports on CPU372. Supports RS-485 port on power supply.
Protocol Support	SNP and SNPX on power supply RS-485 port
Built-in Ethernet Communications	Ethernet (built-in) – 10/100 base-T/TX Ethernet Switch
Number of Ethernet Ports	Two, both are 10/100baseT/TX ports with auto sensing. RJ-45 connection
Number of IP Addresses	One
Protocols	SRTP and Ethernet Global Data (EGD) and channels (producer and consumer); Modbus/TCP Client/Server
EGD Class II Functionality (EGD Commands)	Supports acknowledged single command transfers (sometimes referred to as “datagrams”) and Reliable Data Service (RDS – a delivery mechanism to make sure a command message gets through once and only once).
SRTP Channels	Up to 16 SRTP Channels Up to 36 SRTP/TCP connections total, consisting of up to 20 SRTP Server connections and up to 16 Client Channels.
Web Server Support	Provides basic Reference Table, PLC Fault Table, and IO Fault Table data monitoring over the Ethernet network from a standard web browser
Environmental and Agency Specifications	
Refer to *Installation Requirements for Conformance to Standards,* GFK-1179	

Release Information

Firmware version 12.71 supports Ethernet firmware version 6.12. This Ethernet firmware version addresses a reported issue where the Ethernet enters a blink code 2-5 error during operation.

Ethernet firmware version 6.12 also disables several unnecessary and non-published services in the firmware that otherwise could result in disruption of system operation and/or data corruption. GE Intelligent Platforms strongly recommends that you update to these firmware versions to protect your system from these issues.

For additional details, see "Ethernet Problems Resolved by Firmware Version 7.12"on page 4.

GE Intelligent Platforms recommends disabling FTP server and/or Web server connections if not used. For details, see page 8.

CPU372 PLUS Release History

Revision	Firmware Versions		Date
	CPU	Ethernet	
CPU372-BG	12.71	6.12	Feb-12
CPU372-BF	12.50	4.52	Oct-11
CPU372-AE	12.22	4.52	Mar-10
CPU372-AD	12.21	4.52	Sep-09
CPU372-AC	12.17	4.52	May-09
CPU372-AB	12.16	4.51	Jan-08
CPU372-AA	12.15	4.50	Sep-07

Upgrades

This upgrade is compatible with all CPU372 versions. Earlier versions of CPU372 can be updated to CPU version 12.71 and Ethernet version 6.12 using the following upgrade kit, which can be downloaded from http://www.ge-ip.com/support.

Upgrade Kit: 82A1097–MS10-000-A7

CPU Functional Compatibility

Subject	Description
IC693MDL730 Discrete Output Module version requirements	All IC693MDL730 modules used with a CPU372 *PLUS* must be version E or later. When Revision D or earlier modules are used the module may occasionally update the outputs incorrectly.
HHP compatibility	The CPU372 does not support the Hand Held Programmer.
Programmer version requirements	Proficy* Machine Edition Logic Developer PLC 5.7 or later must be used to configure and program the CPU372 *PLUS.*
C Toolkit compatibility	Version 4.00 or later of the C toolkit must be used for C programming.
IC693CMM321 Ethernet Option Module version requirements	All Series 90-30 Ethernet Interface (IC693CMM321) modules used with this CPU should be updated to IC693CMM321 firmware release 1.10 or later.
FBC compatibility	FIP Bus Controller version 3 or later is required for this CPU.
Power supply compatibility and requirements	A CPU372 requires the use of a ***High Capacity Power Supply (IC693PWR330, IC693PWR331 or IC693PWR332).*** Power consumptions of the CPU372 and its supporting devices are listed below: ■ CPU372 requires 1.48A @ +5VDC (= 7.4 Watts). ■ If used, the converter in the IC690ACC901 serial cable assembly adds 100mA at 5VDC (=0.5 Watts). ■ If used, the IC690ACC900 RS-422/RS-485 to RS-232 converter adds 170 mA at 5 VDC (=0.85 Watts).

Subject	Description
IC693ALG220/221 analog input module version requirements	The CPU37x is not compatible with versions F and earlier of the IC693ALG220/221 Analog Input Modules. Version G or later of the IC693ALG220/221 must be used with these CPUs. If a version F or earlier IC693ALG220/221 module is used with a CPU37x the %AI values reported by the module may exhibit erratic behavior.
IC693PBM200 PROFIBUS Master Module version requirements	All IC693PBM200 modules used with a CPU37x ***must*** be updated to firmware version 1.16 or later. When earlier IC693PBM200 versions are used with CPU37x, backplane communications errors and PLC faults occur frequently while the CPU is in RUN mode.
IC693PBS201 PROFIBUS Slave Module version requirements	All IC693PBS201 modules used with a CPU37x ***must*** be updated to firmware version 1.28.1 or later. Earlier IC693PBS201 versions have issues similar to IC693PBM200 versions earlier than 1.16.
PPDD Compatibility	The PLC Program Download Device, IC690ACC990-BC, is fully compatible with the CPU374/372 *PLUS*.

Ethernet Functional Compatibility

Subject	Description
Programmer version requirements	Proficy* Machine Edition Logic Developer PLC 5.6 SIM 7 or later must be used to use Modbus TCP or to utilize the less restrictive sub-network mask. Proficy Machine Edition Logic Developer PLC 5.0 Service Pack 3 HotFix 3 or later must be used to configure Web Server support or to enable EGD Signatures. Proficy Machine Edition Logic Developer PLC 5.7 or later must be used to configure and program the CPU372 *PLUS.*
CIMPLICITY* Plant Edition Version Requirements	CIMPLICITY Plant Edition 6.1 Service Pack 1a with Update 040204_s90tcp_6101 or Service Pack 2 or later must be used for Ethernet communications with the CPU374 *PLUS* / CPU372 Release 12.0 or greater.
Name resolution	Unlike the CPU364 (IC693CPU364), the CPU372 *PLUS* does not support Name Resolution.
AAUI port	Unlike the CPU364, the CPU372 *PLUS* does not have an AAUI Port.

Ethernet Problems Resolved by Firmware Version 7.12

Subject	Description
Disable unnecessary and non-published services	This release disables several unnecessary and non-published services in the firmware that otherwise could result in disruption of system operation and/or data corruption. GE Intelligent Platforms ***strongly recommends*** that you update to Ethernet firmware version 6.12 or later to protect your system from these issues.
Internal system event causing Blink Code 2-5/Event 3H Issue	Previous versions experienced an error condition where 3 months after a reset and/or power cycle, there was a 10 minute window where the Ethernet module could experience a blink code 2-5 error (Ethernet OK LED blinks 2x, pauses, blinks 5x, long pause and repeats). The TCP traffic (Modbus/SRTP/SNTP) during the 10 minute window, influenced the likelihood of the unit experiencing the issue. Failures could occur outside this 10 minute window, but were much less likely. Note that blink code 2-5 is a general error. Ethernet firmware 6.12 addresses several underlying issues that will result in a blink code 2-5.
Modbus query with exception causing Blink Code (2-5) / Event 3H Issue	When the Ethernet module was communicating with Proficy Machine Edition and it received a Modbus query with exception from a Remote Modbus client, the ETMgenerated a 2-5 blink code (Ethernet OK LED blinks 2x, pauses, blinks 5x, long pause and repeats).

Subject	*Description*
Multiple address resolution protocol (ARP) frames observed on Network	Previous versions experienced an error condition where, after a 3 month period, there was a 10 minute window where it was possible for each packet sent out of the Ethernet Module to be preceded with an ARP packet. This problem is resolved in Ethernet firmware version 6.12 and later.
Unexpected events logged on pushbutton or Station Manager triggered restart	In previous releases, restarting the Ethernet module with an active SRTP connection sometimes caused unexpected events in the Station Manager event log. The unexpected events were 1b/b, 1b/18, and 1b/1f. With release 6.12 these events will not be logged under this condition.

CPU Restrictions and Open Issues

Subject	*Description*
Power supply serial port does not respond to SNP/SNPX requests	The Power Supply Serial Port does not respond to SNP or SNPX requests that include the break character if: ■ an Attach message is received that is missing the last character before the Block Check Code (BCC), ■ a message is received that has an invalid BCC or is corrupted so the calculated BCC doesn't match the BCC specified in the message. Power to the CPU must be cycled to regain communications.
Serial Communication at 1200 baud	A break-free SNP serial connection at 1200 baud may fail occasionally. If failures are observed, users should choose a higher baud rate. Programmer communications are not affected by this problem.
Call to Service Request 24 (Reset Module) may need to be repeated	As expected, a "Loss of, or missing option module" fault is always recorded in the PLC fault table when using SVC REQ #24 to reset an IO module. However, the CPU372 PLUS does not always record the corresponding "Reset of, addition of, or extra option module". Instead, this fault occurs every other execution of SVC #24 rather than every execution.
Using an invalid System ID for the EGD command COMMREQ produces no faults	Using an invalid value for the System ID of a COMMREQ for EGD commands results in the COMMREQ running with no indication of failure. The command appears to be properly initiated even though it did not execute due to the invalid System ID.
CPU372 *PLUS* warm restart time exceeds 5 seconds	CPU372 *PLUS* power-up time takes longer than 5 seconds from the time when power is applied until logic begins execution and I/O is written by the CPU.
Module hardware fault is logged for PCM301	"Module hardware fault" is logged for Programmable Coprocessor module PCM301 in main rack after successive series of power cycles. But the module and its LEDs operate as expected even after logging the fault.
Fault is not logged for extra CMM and HSC module in the rack	When a configuration with just a power supply and a CPU372+ is downloaded to a CPU372+ with HSC, CMM or both modules present in the rack, no extra module or addition of module fault(s) are logged.

Ethernet Restrictions and Open Issues for CPU372 PLUS

Subject	Description
SRTP connections remain open after IP address changed	The Ethernet Interface does not terminate all open SRTP connections before changing its IP address. Once the local IP address has changed, any existing open TCP connections are unable to terminate normally. This can leave SRTP connections open until their underlying TCP connections time out. If quicker recovery of the SRTP connection is needed, modify the "wkal_idle" Advanced User Parameter to reduce the TCP keep alive timer to the desired maximum time for holding open the broken connection. Refer to the *TCP/IP Ethernet User's Manual,* GFK-2382 for details.
Reduced EGD consumption with large numbers of produced exchanges	When large numbers of EGD exchanges are produced at a rapid rate, some consumed EGD exchanges may exhibit lower rates of consumption than expected. To better balance produced and consumed EGD exchange performance, reduce the number or frequency of the produced exchanges configured at this Ethernet Interface.
Spurious 'Ethernet Failure' error	On rare occasions, the error "Module hardware fault" may be reported on the Ethernet daughterboard. The corresponding fault in the exception log is Event = 1, followed by text "Ethernet failure". This fault may be ignored.
Spurious Ethernet fault	In rare instances, after power cycle, the Ethernet Interface may log the following fault, Event = 28H, Entry 2 = 000eH. This fault can be safely ignored.
EGD command passwords are not supported	Optional passwords are not allowed within EGD Command COMMREQs.
EGD command range failure can write partial data to PLC bit memory	When an EGD Command attempts a write operation to a bit-mode PLC reference memory range (%I, %Q; %T, %M, %SA, %SB, %SC) where the amount of data be written exceeds the configured size of that reference memory, the command will return failure status but partial data may be written into the reference memory. The amount of partial data written depends upon the starting bit memory location and the data length as follows: ■ If data starts on a byte boundary (location = (8*n) + 1), no partial data is written. ■ If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by 8 or more bits, partial data is written from the starting location to the next byte boundary after the starting location. ■ If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by less than 8 bits, partial data is written from the stating location to the end of configured reference memory. For a Write PLC Memory command, this can occur when writing data into the target PLC. For Read PLC Memory or Read Exchange commands, this can occur when writing data received from the target PLC into the local PLC memory. The logic application must not use any data returned to the local PLC if the EGD command status indicates failure. To avoid writing partial data to the local or remote PLC, be sure that bit memory data transfers do not exceed the configured reference memory sizes at the appropriate PLC.
Producer ID of zero in capabilities response	Producer ID is set to zero in the EGD Capabilities response if the IP address is set up by the "setIP" utility. Afterwards, any subsequent Hardware Configuration store will have the producer ID reported correctly.
EGD I/O has unexpected variability under heavy load	EGD I/O has intermittent unexpected variability under heavy load. For a Produced Exchange, EGD samples may occasionally be delayed by as much as a production period.
Clear of large hardware configurations may cause log event 08/20	A Log event 08/20 may occur when very large hardware configurations are cleared and transfers are active on other Server connections. This log event can be safely ignored.
Station Manager PING commands	When initiating ICMP echo requests from the PLC via Station Manager's PING command, the operation occasionally fails and an exception is logged (Event 0eH, Entry 2 = 06h).

Subject	*Description*
Web server failure under heavy load	After several hours of heavy load on the web server, the web server may fail to return pages and may cause a LAN system-software fault to be logged. The web server will resume serving pages when the load is reduced.
EGD production is inactive after a Stop-Store of configuration	When upgrading an application from a CPU364 to a CPU372 *PLUS*, sometimes EGD does not start correctly when transitioning from Stop to Run mode. To avoid this problem, you should choose ***not*** to keep the common parameters when replacing the module. This will require you to configure the CPU372 *PLUS* from the default settings.
AUP parameters that specify a UDP port number do not reject a value of 0	The Advanced User Parameters that specify a UDP port number include *gdata_port*, *gctl_port*, and *gXX_udp*. The Ethernet firmware allows these parameters to be set to 0, and no faults are logged if they are set to 0. However, the correct lower limit for the UDP port number is 1. The firmware and the documentation need to be revised accordingly.
AUP file with invalid first line causes failure during store to PLC	For the CPU374/372 *PLUS*, the first line of the AUP file must always be "AUP_0_1". If the first line is incorrect, the PLC rejects the file when it is downloaded from the programmer. This causes the programmer to abort the store, with a report in the feedback window of "Error 8097: Controller Error – Invalid input parameter in request". The PLC logs a fault with Group 129: No User Program present. After one minute, the Ethernet logs a fault (Event 02h, Entry 2 = 07h) to indicate a timeout during configuration. If the configuration included EGD exchanges, there will be an additional log entry for each exchange (Event 28h, Entry 2 = 09h).

CPU Operational Notes

Subject	*Description*
Battery backup limitations	The expected life of a standard Series 90-30 3-volt lithium battery used to back up a CPU372 is 1.2 months when used continuously. If a longer battery backup period is required, the external battery module (IC693ACC302) is available. The extended battery module provides a nominal battery backup period of 15 months for the CPU372. See GFK-2124 for additional information.
Overrides not stored to flash or EZ Program Store Device	When storing reference data to flash or the EZ Program Store Device, overrides are not stored. This means that after the reference data is read back from flash or the EZ Program Store Device and subsequently the PLC is put into Run Mode, the logic may execute differently. Therefore, overrides should not be used if reference data is stored to flash or to the EZ Program Store Device. If overrides are used, particular care should be taken to prevent loading reference data from flash at power up. If this precaution is not observed, unexpected operation may occur upon power cycle.
Writing flash using a serial programmer	When writing very large programs to flash memory, you may need to increase the request timeout value in the programming software to avoid receiving a request timeout message. An upper bound of 25 seconds is typically satisfactory. For further details, see the "Ethernet Operational Notes" item "Store of Program or Reference Tables to Flash may Cause Loss of Ethernet Communications" on page 10.
Storing large configurations	A Series 90-30 PLC using a CPU372 supports a maximum of 32 DSM314 modules. This number is reduced when other intelligent modules are used in the PLC, such as APM and GBC modules. It may also be reduced when: ■ The number of racks in the PLC increases; ■ The total size of logic, motion and AUP files increases; ■ The application uses C logic blocks or a C logic program; and ■ Connected programmers or HMI devices are used to read reference memory or fault tables. In some cases it may be possible to increase the number of DSM314 modules that the CPU372 will accept in the hardware configuration by storing logic first and then storing the configuration separately.

Subject	Description
Simultaneous load and store	When operating with multiple programmers attached, initiating a store operation from one programmer during a load operation from another programmer will cause the load to fail.
Transition Tables are not cleared when the reference tables are cleared	The transition tables are not cleared when the reference tables are cleared through the programmer.
Upgrading firmware with many modules in rack	The process of upgrading the PLC firmware with the WinLoader utility may fail when multiple IO modules are in the main, remote or expansion racks, due to the extra time it takes to restart the PLC CPU. If the upgrade process fails, wait until the OK LED on the power supply stops blinking and then click the Retry button on the WinLoader Firmware Update Failed dialog box. If the upgrade fails again, move the PLC CPU to a rack without IO modules and restart the upgrade process.
Auto-baud feature not supported	The serial auto-baud feature, intended to allow a serial connection at lower baud rates than the default 19.2K, is not supported on the CPU372. If you want to connect at a non-default baud rate, the proper configuration should first be stored to the PLC.
COMMREQs are not supported to Rack 0 Slot 15 Task 0	The CPU36X supported sending COMMREQs to the daughtercard by sending the COMMREQs to Rack 0 Slot 15 Task 0. The CPU37x line of CPUs does not support these COMMREQs. COMMREQs should instead be addressed to Rack 0 Slot 1 and the appropriate Task. For additional information, refer to the *TCP/IP Ethernet User's Manual,* GFK-2382.
Fault is not logged if power cycling is done when using the portable download device to transfer to the PLC	Power should not be cycled when performing operations with the portable download device. Cycling power can result in the downloaded data not being properly stored, which will cause the PLC to clear the memory on power-up.
90-30 High Speed Counter may be lost over multiple successive power cycles.	The 90-30 HSC module may not complete its initialization and set its module ready bit after a series of power cycles in close succession. Upon failure the module needs to be reset or the rack needs to be power cycled once more.

Ethernet Operational Notes

Subject	Description
One TTL value configuration for all EGD groups	The system accepts only one TTL value configuration. If you configure separate TTL values for each EGD group, the minimum TTL value will be configured for all EGD groups.
Protection against attack on FTP Server	When FTP connections and/or Web Server Connections are not in use, the configuration of number of FTP server connections and/or number of Web server connections should be set to 0. This protects against attack on FTP Server. The configuration for the “Max number of FTP Server Connections” and “Max number of Web Server Connections” can be found in the “Ethernet” tab of the CPU configuration screen in Proficy Machine Edition.
Configuration of IP address is required before using ethernet communications	The Ethernet Interface within the CPU module cannot operate on a network until a valid IP address is configured. The necessary Ethernet addressing information must be configured prior to actual network operation, or to recover from inadvertent changes to the Ethernet addressing data at the Ethernet Interface. Use one of the following methods to initially assign an IP address: ▪ Connect a serial terminal to the Station Manager port of the PLC. Then use the CHSOSW command to enter the desired IP address. For details, see the *TCP/IP Ethernet for Series 90-30 CPU372/CPU374 PLUS Station Manager Manual*, GFK-2383. ▪ Temporarily assign an IP address to the module using the SetIP tool over the Ethernet network. For details, see *TCP/IP Ethernet for Series 90-30 CPU372/CPU374 PLUS User's Manual,* GFK-2382. Once a temporary IP address has been set up, the Ethernet Interface can be accessed over the network (such as by the Machine Edition programming software). The programmer should then be used to configure the proper IP address for the Ethernet Interface.

Subject	*Description*
LAN must be tree, not ring	The two Ethernet network ports on the Ethernet Interface must not be connected, directly or indirectly, to the same network device. The hub or switch connections in an Ethernet network must form a tree and not a ring; otherwise duplication of packets and network overload may result. In this situation, the Ethernet modules will continually reset.
Reporting of duplicate IP address	The CPU 372 *PLUS* does not log an exception or a fault in the PLC Fault Table when it detects a duplicate IP address on the network.
Proper IP Addressing is Always Essential	The CPU's embedded Ethernet Interface must be configured with the correct IP Address for proper operation in a TCP/IP Ethernet network. Use of incorrect IP addresses can disrupt network operation for the PLC and other nodes on the network. Refer to TCP/IP Ethernet for Series 90-30 CPU374 PLUS User's Manual, GFK-2382 for important information on IP addressing. When storing a new HW configuration to the PLC, be sure that the HW configuration contains the proper Ethernet addressing data (IP Address, Subnet Mask, and Gateway IP Address) for the PLC. Note: Machine Edition programming software maintains the target IP address (used to connect the programmer to the target) independent of the contents of the HW Configuration for that target. The target IP address is set in the Target Properties in the ME Inspector window. Storing a HW Configuration whose Ethernet addressing data contains an IP Address that is different from the PLC target IP address will change the IP address used by the target PLC as soon as the Store operation is completed; this will break the Programmer connection. Before attempting to reconnect the Programmer, you must change the target IP address in the Target Properties in the CME Inspector window to use the new IP address. To regain communication at the former IP address, use the manual corrective action described above. Storing a HW Configuration containing default (0.0.0.0) or incorrect Ethernet addressing data to the PLC will result in loss of the Programmer connection and will require manual corrective action as described above.
Multiple zero-period EGD exchanges may not produce similar numbers of samples	If more than one EGD produced exchange is configured for a production period of zero, the exchanges may not produce similar numbers of samples. Due to the way that scheduling occurs when multiple exchanges are scheduled "as fast as possible", some zero period exchanges may produce significantly more samples than others. For more consistent EGD production, configure the produced EGD exchanges with non-zero production periods.
Changing IP address while SRTP connection is open may generate log events	Open SRTP Server connections established with a remote SRTP client are not terminated as expected when the PLC's IP address is changed (typically by storing a new HW Configuration). A Series 90 SRTP client ("SRTP channels") reports either a 9690H or 0190H status; the SRTP connection may remain open until the connection is terminated as a result of a client timeout.
AUP parameter should not be changed	The Advanced User Parameter "wsnd_buf" should not be changed by the user. Changing the value of this parameter may cause the LAN LED to go out and the Ethernet Interface to drop the connection.
Heavy load can block station manager	As explained in the *TCP/IP Ethernet for Series 90-30 CPU372 and CPU374 PLUS Station Manager Manual*, GFK-2383, Chapter 1, a heavy EGD and/or SRTP load can block Station Manager operation.
Web server browser restrictions	Internet Explorer version 4.0 running on Windows 98 will give an error when the reference table web page is accessed. Web Server operation has been verified with Internet Explorer version 5.0
Very heavy EGD production/consumption at server may cause EGD command timeouts	Very heavy EGD production and/or consumption at a server device may cause EGD command timeout errors when another device attempts to send EGD commands to that server. If EGD commands must preempt normal production, you may set the "gcmd_pri" Advanced User Parameter to 2 (see GFK-2224, Appendix A). Note that by doing so, EGD exchange production may be delayed.

Subject	Description
SRTP application timeouts must accommodate network connection overhead	The application timeouts within SRTP Channels also include the time needed to establish and maintain the underlying network and SRTP connection. Examples are establishing the TCP connection for a new channel, establishing communication with the remote device, and TCP retransmissions during Channel operations. If the time needed for TCP connection establishment or maintenance exceeds the user-specified channel application timeout values, an application timeout will occur. Channel application timeouts are temporary errors; the channel continues to run.
AUP parameter "gcmd_pri" does not affect the behavior of EGD	The Advanced User Parameter “gcmd_pri” does not have the desired effect in the CPU372 *PLUS*. Under sufficiently heavy EGD data exchange load, EGD commands may still be blocked from execution.
Firmware update failure with “Reset of Daughter Board” fault	Some revision –EK and -EL units that exhibit the “reset of daughterboard” fault described in problem ID code ISS027428 may fail during a firmware update. Customers who experience this issue should contact Technical Support.
SRTP channel data coherency for atomic operations is limited to 256 bytes (128 words).	For SRTP channel transfers, data lengths beyond 256 bytes are not guaranteed to have coherency as they are not guaranteed to be all written at once. The channel status bits or RDCS status should be used to determine when the entire transfer is completed.
Requests for invalid memory types on remote servers can return different error codes.	The error code generated when accessing an invalid memory type on a remote server for a CPU372 *PLUS* is not the error code expected. The expected error code is 8390, however a 9590 error code is received.
Ethernet programmer may briefly lose communications when configuration stored	Storing a PLC configuration containing Ethernet configuration values may require the Ethernet interface to restart itself in order to use any changed configuration values. When the Ethernet interface restarts, an Ethernet PLC Programmer briefly reports a loss of communications. If this occurs, the Ethernet Interface will post two or more PLC faults with the text “LAN system-software fault; resuming”, and fault-specific data starting with 080008 and/or 080042. In addition, faults with text “Bad remote application request; discarded request” (1B0021) and “Local request to send rejected; discarded request” (110005) may occur. When these faults occur, the STAT LED on the CPU372 is turned off to indicate posting of faults to the PLC fault tables. In some cases, a 10-second delay may occur before loss of communications is detected. Normal operation resumes once the Ethernet Interface restarts. The STAT LED can be reset using the Station Manager OK command. When the PLC configuration is stored from an Ethernet PLC Programmer, the communications loss occurs immediately after successful completion of the store. Attempts to store configuration plus logic and/or reference tables in one operation can fail. However, storing configuration separately from logic or reference tables always succeeds.
Store of program or reference tables to flash may cause loss of Ethernet communications	While storing the PLC program, configuration, and/or reference tables from PLC RAM memory into Flash memory or to the EZ Program Store device, Ethernet data communications may be lost. Normal data transfers are temporarily suspended during a Flash or EZ Program Store device store operation. In these cases, Ethernet data transfers (such as used by an Ethernet PLC Programmer connection) will fail when the store exceeds the 16-second maximum period allowed for completion. Upon completion of the store operation, normal operation will resume. If a timeout occurs during a store to Flash or EZ Program Store device, the timeout value should be increased in the programming software being used. See the User’s Manual for the programming software for more details.
COMMREQ status word returns AA90 (attempt to establish a TCP connection with a remote server failed) error code	For connections with Ethernet channels (Modbus/TCP or SRTP), if the connect COMMREQ or subsequent RDCS command returns an AA90 error code in the COMMREQ status word, the connection attempt should be tried again within user logic.
COMMREQ status word returns 8890 (invalid channel number) error code	If the connect COMMREQ for a Modbus/TCP client connection returns a successful status (1) but subsequent COMMREQs on the connection result in an 8890 status, the connection should be tried again within user logic. Subsequent COMMREQs on the newly re-opened connection should succeed.
Station Manager RMDIR (remove directory) commands	Issuing the Station Manager command *RMDIR dir1/dir2* does not result in *dir2* being removed. Instead, the error "RMDIR failed, dir1/dir2 does not exist" is returned. As a workaround, use “*CD dir1*” to reach the subdirectory before issuing “*RMDIR dir2*”.

Subject	*Description*
Client Channels TCP resource management	There is a period of time that the OS Network stack hangs on to the TCP resources associated with a connection after it is closed. It applies to the initiator of the close, which is almost always the client side. This time is referred to as the "TCP Linger Period". Once the TCP Linger Period expires (60 seconds in the current OS implementation), the TCP resources are released. Application developers using client channels need to be aware of this behavior when designing their logic. There are a finite number of TCP resources allocated to client channels, and if channel connections are brought up and down so fast that these resources are depleted, then the application may have to wait until a TCP resource frees up in order to establish another client channel (a COMMREQ Status of 0xA890 is returned if no TCP resources are currently available; application should wait and retry again). SRTP Client Channels provides features that help the user preserve TCP connections. These include a "period time" where one can establish an SRTP Channel and specify the channel to run at a given interval, or run as fast a possible. One can also specify a number of iterations, or run forever. Additionally, SRTP Channels allows re-tasking of an active channel to the same remote device, where the parameters of an active channel, such as the channel command type (Read/Write), number of repetitions, time periods, local memory address, remote memory address, etc. can be changed. SRTP Channels also allows re-tasking of an active channel to a different remote device (changing the remote device's IP address, etc.). However, re-tasking to a different remote device will neither conserve TCP connections, nor save on the time it takes to create a channel.

Product Documentation

Series 90-30 PLC Installation and Hardware Manual, GFK-0356

Series 90-30/20/Micro PLC CPU Instruction Set Reference Manual, GFK-0467

TCP/IP Ethernet for Series 90-30 CPU372 PLUS and CPU374 PLUS User's Manual, GFK-2382

TCP/IP Ethernet for Series 90-30 CPU372 PLUS and CPU374 PLUS Station Manager Manual, GFK-2383

Auxiliary Battery Module, GFK-2124

Installation in Hazardous Areas

The following information is for products bearing the UL marking for Hazardous Areas:

- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.
- WARNING - EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C & D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY.